SIZE, SHAPE, AND LOCATION CAN YOU TELL?

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Course Name: 7th Grade Integrated

Core Curriculum Standard Fulfilled: Standard II; Students will understand the relationship between properties of matter and Earth's structure.

Core Curriculum Objective Fulfilled: Objective 2; Analyze how density affects Earth's structure.

Intended Learning Outcomes (ILO's) Fulfilled:

- 1a. Observe objects and events for patterns and record both qualitative and quantitative information.
- 2b. Raise questions about objects, events, and processes that can be answered through scientific investigation.
 - 4a. Provide relevant data to support their inferences and conclusions.
- 6b. Understand that science investigations use a variety of methods and do not always use the same set of procedures; understand that there is not just one "scientific method".

Time Needed to Complete Inquiry: 20 -25 minutes.

Inquiry: Structured: Can you determine the size, shape, and location of an object embedded in the clay by probing?

Prior Knowledge Needed: No background knowledge needed at this point. The activity can be used to prepare to discuss how seismic waves travel through solids and liquids.

Introduction: This is a game to see if you can tell the size, shape, and location of an object inside the clay ball

Materials/Resources Needed for the Investigation: Each lab group will need:

- a stick of modeling clay
- a large marble/ball bearing etc
- 8 10 pins/skewers/large toothpicks

Procedures of the Investigation:

1. Give each lab group a pre-built clay ball formed around a large marble/ball bearing etc.

- 2. Tell each group to carefully push the pins/skewers through the clay ball. All pins/skewers/large toothpicks should enter the clay ball at approximately the same point, but at different angles. You may need to demonstrate.
- 3. Stop pushing the pins/skewers/large toothpicks when it meets any resistance. Tell students they can repeat steps #2 and #3 at different locations on the clay ball.
- 4. Write down (or draw) what you have observed about the positioning of the pins/skewers/large toothpicks.
- 5. Talk within the lab groups and see if they can determine the size, shape, and location of the object inside their clay ball.

Data Collection: Students will collect data when they write down or draw their observations for the positioning of the skewers.

Data Analysis: Have each lab group draw a picture of what they can infer as to what caused the positioning of the skewers and why.

Have students understand that they used visual cues (the skewer probes) to make inferences about something they could not see. This form of investigation is also a valid "scientific method" as long as the evidence (data) supports the inference.